



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/648,381	08/25/2000	Akella V. S. Satya	KLAIP016G	5883

22434 7590 04/25/2003

BEYER WEAVER & THOMAS LLP  
P.O. BOX 778  
BERKELEY, CA 94704-0778

EXAMINER

STEVENSON, ANDRE C

ART UNIT	PAPER NUMBER
----------	--------------

2812

DATE MAILED: 04/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/648,381	<b>Applicant(s)</b> SATYA ET AL	
	<b>Examiner</b> Andre' C. Stevenson	<b>Art Unit</b> 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 15-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 5 and 9-14 is/are rejected.
- 7) ☒ Claim(s) 2, 3 and 6-8 is/are objected to.
- 8) ☐ Claims \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some \* c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

**Attachment(s)**

- |   |  |
|---|--|
| 15) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 18) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s) ____    |
| 16) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 19) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 17) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> | 20) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

During a telephone conversation with Mary Olynick on April 10, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1 through 14. Affirmation of this election must be made by applicant in replying to this Office action. Claims 15 through 25 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims **1, 9, 10, 11, 12, 13 & 14**, are rejected under 35 U.S.C. 102(b) as being unpatentable over Garllarda et al (U.S. Pat. No.6539106 B1).

Garllarda et al (U.S. Pat. No.6539106 B1), for **Claim #1**, a method for detecting electrical defects on test structures of a semiconductor die, the test structures including a plurality of electrically-isolated test structures and a plurality of non-electrically-isolated test structures (**Column 2, lines 5 through 12**), the test structures each having a portion located partially within a scan area, the method

comprising: a. scanning the portion of the test structures located within the scan area to obtain voltage contrast images of the test structures' portions; and in a multi-pixel processor, analyzing the obtained voltage contrast images to determine whether there are defects present within the test structures, (Abstract, Column 4, lines 61 through 67, Column 5, lines 1 through 34, lines 45 through 50, Column 14, lines 42 through 62, Column 16, lines 35 through 51).

With respect to **Claim #9**, a method as recited in claim I wherein the obtained voltage contrast images are analyzed by comparing them to a truth table, is taught by Garllarda et al (U.S. Pat. No.6539106 B1) (Column 7, lines 35 through 59).

Furthermore, **Claim #10**, a method as recited in claim 9 wherein the truth table includes expected brightness levels for the scanned portions of the test structures, is taught by Garllarda et al (U.S. Pat. No.6539106 B1) (column 7, lines 61 through 67, column 8, lines 1 through 32).

With respect to **Claim #11**, a method as recited in claim I wherein the obtained voltage contrast images are analyzed by comparing them to a plurality of images from an adjacent semiconductor die, is taught by Garllarda et al (U.S. Pat. No.6539106 B1)) (column 1, lines 52 through 67, column 2, lines 1 through 4).

With respect to **Claim #12**, a method as recited in claim 1 wherein the obtained voltage contrast images are analyzed by comparing them to a plurality of images from an adjacent other plurality of test structures on the semiconductor die, is taught by Garllarda et al (U.S. Pat. No.6539106 B1) (column 1, lines 52 through 67, column 2, lines 1 through 4).

Furthermore, **Claim #13**, a method as recited in claim 10 wherein the comparison is accomplished in an array mode, is taught by Garllarda et al (U.S. Pat. No.6539106 B1) (column 14, lines 61 through 67, column 15, lines 1 through 34).

With respect to **Claim #14**, a method as recited in claim 1 wherein the scanning is accomplished with an electron beam, is taught by Garllarda et al (U.S. Pat. No.6539106 B1)) (Abstract, Column 4, lines 61 through 67, Column 5, lines 1 through 34, lines 45 through 50).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims **4 & 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Garllarda et al (U.S. Pat. No.6539106 B1) as applied to claims **1, 9, 10, 11, 12, 13 & 14** above, and further in view of Talbot et al (U.S. Pat. No.6091249).

Garllarda et al (U.S. Pat. No.6539106 B1) discloses the claimed invention except for wherein scanned portions of the electrically isolated test structures are expected to have substantially a same first brightness level, and the scanned portions of the non-electrically isolated test structures are expected to have substantially a same second brightness level that differs from the first brightness level. Talbot et al (U.S. Pat. No.6091249) teaches that it is known to have scanned portions of the electrically isolated test structures are expected to have substantially a same first brightness level, and the scanned portions of the non-electrically isolated test structures are expected to have substantially a same second brightness level that differs from the first brightness level.

Thus, claim **4**, method as recited in claim 1 wherein the scanned portions of the electrically isolated test structures are expected to have substantially a same first brightness level, and the scanned portions of the non-electrically isolated test structures are expected to have substantially a same second brightness level that differs from the first brightness level, is taught by Talbot et al (U.S. Pat. No.6091249) (column 2, lines 30 through 41, column 4, lines 33 through 42).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have scanned portions of the electrically isolated test structures are expected to have substantially a same first brightness level, and the scanned portions of the non-electrically isolated test structures are expected to have substantially a same second brightness level that differs from the first brightness level as taught by Talbot et al (U.S. Pat. No.6091249), since Talbot et al (U.S. Pat. No.6091249) states at column 2, lines 30 through 41 that such the voltage of a structure being imager determines the brightness of that structure in the image.

Furthermore, **Claim #5**, a method as recited in claim 1 wherein the obtained voltage contrast images are analyzed by comparing them to a plurality of reference images, is taught by Talbot et al (U.S. Pat. No.6091249) (column 1, lines 52 through 67, column 2, lines 1 through 4).

### **Objected Claims**

Claims 2, 3, 6 & 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### **Claim #2**

- ❖ Pixel resolution sizes in a range of about 25 nm to 200nm.

Claim 3, 6 & 7

- ❖ Pixel size nominally equivalent to two times a width of the test structure's line width to maximize throughput at optimal signal to noise sensitivity.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andre' Stevenson whose telephone number is (703) 308 6227. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached on (703) 308 3325. The fax phone number for the organization where this application or proceeding is assigned is (703) 308 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956. Also, the proceeding numbers can be used to fax information through the Right Fax system;

- TC2800 Official Before-Final RightFAX - (703) 872-9318
- TC2800 Official After-Final RightFAX - (703) 872-9319
- TC2800 Customer Service RightFAX - (703) 872-9317

Andre' Stevenson

Art Unit 2812



Application/Control Number: 09/648,381

Page 8

Art Unit: 2812

03/14/03

*gubly*